

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

EVERLIGHT ELECTRONICS CO., LTD.,
and EMCORE CORPORATION,

Plaintiffs/Counter-Defendants,

Case No. 12-11758
Honorable Gershwin A. Drain

v.

NICHIA CORPORATION, and
NICHIA AMERICA CORPORATION,

Defendants/Counter-Plaintiffs,

v.

EVERLIGHT AMERICAS, INC.

Defendant.

OPINION AND ORDER REGARDING CLAIM CONSTRUCTION

I. INTRODUCTION

This matter is before the court for claim construction relative to United States Patent No. 5,998,925 (“‘925 Patent”), United States Patent No. 7,531,960 (“‘960 Patent”), and United States Patent No. 6,653,215 (“‘215 Patent”). A *Markman* hearing was held on August 13, 2013. *See Markman v. West View Instruments, Inc.*, 517 U.S. 370 (1996). The patents-in-suit relate to light emitting diode (“LED”) devices and the parties are business competitors in the manufacture and supply of these products.

Everlight Electronics Co., Ltd. and Emcore Corporation filed the instant action seeking a declaratory judgment of non-infringement, invalidity, and unenforceability of Nichia Corporation’s

patents, the '925 Patent and the '960 Patent, as well as alleging direct and indirect infringement of the '215 Patent,¹ against Nichia Corporation and its subsidiary, Nichia America Corporation (collectively "Nichia"). Nichia filed Counterclaims against Emcore Corporation, Everlight Electronics Co., and its subsidiary, Everlight Americas, Inc. (collectively "Everlight"), for direct and indirect infringement of the '925 and '960 Patents. Nichia also seeks a declaratory judgment of non-infringement and invalidity of the '215 Patent.

II. TECHNOLOGY BACKGROUND

An LED is a semiconductor device that emits light when an electrical energy is applied and an electrical current flows through the semiconductor material. The '925 Patent, entitled LIGHT EMITTING DEVICE HAVING A NITRIDE COMPOUND SEMICONDUCTOR AND A PHOSPHOR CONTAINING A GARNET FLUORESCENT MATERIAL, focuses on the use of yttrium-aluminum-garnet ("YAG") phosphors in LEDs to create a wide range of white light. White light is created with a device, including a semiconductor-based light emitting component capable of emitting blue light and a resin with a phosphor that absorbs part of the blue light and emits a yellowish light. The two different colors or wavelengths of light are mixed and perceived by the human eye as white light. The '925 Patent's Abstract states:

The white light emitting diode comprising a light emitting component using a semiconductor as a light emitting layer and a phosphor which absorbs a part of light emitted by the light emitting component and emits light of wavelength different from that of the absorbed light, wherein the light emitting layer of the light emitting component is a nitride compound semiconductor and the phosphor contains garnet fluorescent materials activated with cerium which contains at least one element selected from the group consisting of Y, Lu, Sc, La, Gd and Sm, and at least one element selected from the group consisting of Al, Ga and In and, and [sic] is subject to less deterioration of emission characteristic even when used with high luminance

¹ Emcore is the owner by assignment, and Everlight is the exclusive licensee of the '215 Patent.

for a long period of time.

Dkt. No. 99, Ex. A.

The '960 Patent, entitled LIGHT EMITTING DEVICE WITH BLUE LIGHT LED AND PHOSPHOR COMPONENTS, claims priority to the '925 Patent and concerns how the phosphor is distributed in the resin covering the semiconductor component. The '960 Abstract states:

A light emitting device includes a light emitting component; and a phosphor capable of absorbing a part of light emitted by the light emitting component and emitting light of a wavelength different from that of the absorbed light. A straight line connecting a point of chromaticity corresponding to a peak of the spectrum generated by the light emitting component and a point of chromaticity corresponding to a peak of the spectrum generated by the phosphor is disposed along with the black body radiation locus in the chromaticity diagram.

Id., Ex. B. Thus, both the '925 and '960 Patents cover the use of particular phosphors in white LED technology enabling efficient, long-lasting, high luminance LEDs in a wide variety of applications including computer and cellular telephone displays.

The '215 Patent, entitled CONTACT TO N-GAN WITH AU TERMINATION, is directed to forming a low-resistance ohmic contact to an LED semiconductor in order to prevent certain deleterious effects including heating, reduced efficiency and LED device failure. The '215 Patent's Abstract states:

A contact for n-type III semiconductor such as GaN and related nitride-based semiconductors is formed by depositing Al, Ti, Pt and Au in that order on the n-type semiconductor and annealing the resulting stack, desirably at about 400-600°C. for about 1-10 minutes. The resulting contact provides low resistance, ohmic contact to the semiconductor and excellent bonding to gold leads.

Id., Ex. C. The purpose of an ohmic contact is to transfer electrical current originating from a power supply (such as a battery) through the contact without excessive hindrance, into the semiconductor. Ohmic contacts are composed of a metal layer or layers, deposited on the semiconductor. An ohmic contact must have a low contact resistance, i.e., the contact allows

electric current to pass into and out of an LED with a minimum amount of resistance.

III. CLAIM CONSTRUCTION

A. Standard of Review

A determination of infringement requires a two-step analysis. *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1476 (Fed. Cir. 1998). “First, the claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process.” *Id.* Claim construction is an issue of law. *Markman*, 517 U.S. at 388-90. In interpreting claims, a court “should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Absent an express intent to impart a novel meaning, “terms in a claim are to be given their ordinary and accustomed meaning.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). It is the claims that measure the invention. *SRI Int’l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985).

Although accorded less weight than intrinsic evidence, extrinsic evidence, such as expert testimony, dictionaries, and treatises, can also be helpful. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005). Therefore, extrinsic evidence “may be considered if the court deems it helpful,” provided the court “attach[es] the appropriate weight” to extrinsic sources “in light of the statutes and policies that inform patent law.” *Id.* at 1317-18, 1324.

Claim construction always begins with the language of the claim and asks “how a person of ordinary skill in the art understands a claim term.” *Id.* A “person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* at 1313. It is

“improper to read [a claim] term to encompass a broader definition” than the ordinary and customary meaning revealed by the context of the intrinsic record.” *Nystrom v. Trex Co.*, 424 F.3d 1136, 1145 (Fed. Cir. 2005). Indeed, “[c]laims cannot be of broader scope than the invention set forth in the specification.” *Id.*

The prosecution history “inform[s] the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317. The Federal Circuit has held:

The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution. Accordingly, where the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender. Such a use of the prosecution history ensures that claims are not construed one way in order to obtain their allowance and in a different way against accused infringers.

Chimie v. PPG Indus., 402 F.3d 1371, 1384 (Fed. Cir. 2005).

B. ‘925 Patent’s Disputed Terms

1. “a garnet fluorescent material comprising 1) at least one element selected from the group consisting of Y, Lu, Sc, La, Gd and Sm, and 2) at least one element selected from the group consisting of Al, Ga and In, and being activated with cerium”

“garnet florescent material activated with cerium which contains at least one element selected from the group consisting of Y, Lu, Sc, La, Gd and Sm, and at least one element selected from the group consisting of Al, Ga and In”

Nichia’s Proposed Constructions
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“a garnet fluorescent material comprising 1) one or more elements of the group of elements consisting of Y, Lu, Sc, La, Gd and Sm, including any combinations thereof, and 2) one or more elements of the group of elements consisting of Al, Ga, and In, including any combinations thereof, and being activated with cerium”

Revised: “a garnet fluorescent material comprising 1) Yttrium, Lutetium, Scandium, Lanthanum, Gadolinium, or Samarium, or any mixtures or combinations of these elements; and 2) Aluminum, Gallium, or Indium, or any mixtures or combinations thereof, and being activated with cerium”

Everlight’s Proposed Construction

“a garnet fluorescent material comprising one or more elements selected from Yttrium, Lutetium, Scandium, Lanthanum, Gadolinium, and Samarium; and one or more elements selected from Aluminum, Gallium, and Indium, and being activated with cerium”

Claims 1 and 23 of the ‘925 Patent recite a “garnet fluorescent material” and define the constituent ingredients for the YAG phosphor by using a special form of claim language known as the *Markush* group. See *Abbott Labs. v. Baxter Pharm. Prods.*, 334 F.3d 1274, 1280 (Fed. Cir. 2003) (“A *Markush* group is a listing of specified alternatives of a group in a patent claim” or “a sort of homemade generic expression covering a group of two or more different materials.”) The typical form for a *Markush* group is “a member selected from the group consisting of A,B and C,” which covers one and only one member. *Id.* Nichia has proposed two constructions for this term. Nichia’s first construction included the language “one or more elements,” and “including combinations thereof.” Nichia’s second proposed construction omits “at least one element selected from the group consisting of” language and replaces it with “any mixtures or combinations” language. Nichia argues its proposed construction comports with the law governing interpretation of *Markush* group claims and the intrinsic record and Everlight’s proposed usage of “one or more elements selected from the group” does not provide sufficient guidance.

Here, Claim 1 includes a garnet-fluorescent phosphor “comprising 1) at least one element selected from the group consisting of Y, Lu, Se, La, Gd and Sm, and 2) at least one element selected

from the group consisting of Al, Ga and In, and being activated with cerium.” An example of the garnet-fluorescent material is “ $\text{Gd}_3\text{In}_5\text{O}_{12}:\text{Ce}$ ” which consists of Gadolinium from the first group and Indium from the second group and activated with Cerium. Thus, Everlight’s proposed construction comports with the intrinsic record because “comprising one or more elements selected from” covers embodiments with one element from each group such as “ $\text{Gd}_3\text{In}_5\text{O}_{12}:\text{Ce}$ ” as well as covers embodiments with more than one element from a group such as “ $(\text{Y}_{0.6}\text{Gd}_{0.4})_3\text{Al}_5\text{O}_{12}:\text{Ce}$.” See ‘215 Patent, 7:5354. See *Fresenius USA, Inc. v. Baxter Int’l, Inc.*, 582 F.3d 1288, 1298 (Fed. Cir. 2009) (holding the phrase “at least one unit selected from the group consisting of [listing of four units]” covered embodiments where only one unit was selected and disclosed.)

Nichia’s reliance on *Abbott Laboratories, supra*, is unavailing as the Federal Circuit merely clarified that Markush-type claims are not always limited to a single option selected from the group of options, but can cover multiple members if appropriate language is used. *Abbott Labs.*, 334 F.3d at 1281 (“Thus, without expressly indicating the selection of multiple members of a Markush grouping, a patentee does not claim anything other than the plain reading of the closed claim language.”). The *Abbott* court did not instruct courts to always construe the disputed language herein as meaning “combinations or mixtures.” Nichia’s use of “any mixtures or combinations” will cause jury confusion by making it more difficult to understand that the claims cover embodiments with only one of the elements in each group. The Court therefore adopts Everlight’s proposed construction of this term.

2. “main emission peak”

Nichia's Proposed Construction
"peak emission wavelength"
Everlight's Proposed Construction
"the wavelength at the point of greatest intensity on the emission curve"

Claims 9 and 23 require that "the main emission peak of the light emitting component is set within the range from 400 nm to 530 nm and the main emission wavelength of the phosphor is set to be longer than the main emission peak of the light emitting component." See '215 Patent at 34:18-23. The parties agree that this term refers to a wavelength of light. However, the Court finds that Everlight's proposed construction adds confusion and extraneous limitations finding no support from the intrinsic record. Specifically, Everlight's proposed construction refers to "the point of greatest intensity on the emission curve." Everlight argues the "main emission peak" is limited to a single wavelength and does not cover a range of wavelengths as suggested by Nichia. See '925 Patent, FIG. 18B. However, nowhere does the patent describe the main emission peak as a "point." Further, reference to "emission curve" is confusing as the claims do not refer to an emission curve. In fact the '925 Patent suggests that there is not a well defined, "point of greatest intensity" for the light emitting component. See '925 Patent at 9:13-15 ("Although light emitted by the light emitting component has a monochromatic peak, the peak is broad and has a high color rendering property.")

The intrinsic record makes clear that the "main emission peak" refers to a property of the semiconductor component, i.e., the peak emission wavelength of light output by the semiconductor. Additionally, Nichia's proposed construction is supported by probative extrinsic evidence that its construction reflects the common understanding of the term as used in the field. See T.A. Fisher *et al.*, *Electroluminescence From a Conjugated Polymer Microactivity Structure*, APPLIED PHYSICS LETTERS, Vol. 67, Issue 10, Sept. 4, 1995 at 1356-57 (using the terms "main emission peak" and

“peak emission wavelength” interchangeably); M.S. Weaver et al., *Recent Progress in Polymers for Electroluminescence: Microactivity Devices and Electron Transport Polymers*, THIN SOLID FILMS, Vol. 273, Feb. 1996 at 43-44. Thus, the Court adopts Nichia’s proposed construction of this term.

3. “wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Y and Al”

Nichia’s Proposed Construction
No construction necessary
Everlight’s Proposed Construction
“wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Yttrium and Aluminum that is different from the said garnet fluorescent material”

Here, the disputed term is found in dependent Claim 2, which reads: “A light emitting device according to claim 1, wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Y and Al.” ‘925 Patent at 31:38-40. Nichia argues that this term should be given its ordinary and plain meaning in the context of the ‘925 Patent and the Court agrees. Specifically, the phosphor in Claim 1, referred to in Claim 2 as “the phosphor used,” includes a “yttrium-aluminum-garnet fluorescent material containing Y and Al.”

Claim 2 depends from Claim 1, and specifies a further limitation on the phosphor described in Claim 1. *See* 35 U.S.C. 112, 4 (“[A] claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed.”) Claim 1 indicates that the phosphor contains a garnet fluorescent material comprising at least one element from two groupings of listed elements. Claim 2 specifies that the “phosphor used” in Claim 1 “contains an yttrium-aluminum-garnet fluorescent material containing Y and Al.” Thus, Claim 2 further limits the garnet fluorescent material of Claim 1 by requiring that it include Y and Al.

Everlight seeks to import into Claim 2 a requirement that there be two different garnet

fluorescent materials, which is not supported by the claim or specification. Nothing in the intrinsic record supports the narrow construction proposed by Everlight. Claim 2 is the first of three dependent claims from Claim 1, and none of these claims disclose two different garnet fluorescent materials. In fact, other dependent claims, such as Claim 5, specifically disclose different fluorescent materials, such as “two or more yttrium-aluminum-garnet fluorescent materials” ‘*See* 925 Patent at 31:51-54. Therefore, Claim 5 demonstrates that Claim 2 is not properly construed as requiring two different garnet fluorescent materials. *See Phillips*, 415 F.3d at 1314 (“Other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of the claim term.”). Thus, the Court rejects Everlight’s proposed construction and finds that this term requires no construction.

4. “a general formula $(\text{Re}_{1-r}\text{SM}_r)_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$, where $0 \leq r < 1$ and $0 \leq s \leq 1$ and Re is at least one selected from Y and Gd”

Nichia’s Proposed Constructions
<p>“a chemical formula having the elements Sm, Al, Ga, O, and Ce as well as Re, where:</p> <ol style="list-style-type: none"> 1) O and Ce are present; 2) some amount of Re is present; 3) each of Sm, Al, Ga may be present but is not required to be present; 4) r is a variable that defines the amount of Sm relative to Re, such that where $r=0.5$, for example, the relative amounts of Ga and Al are equal; and where Re represents one or both elements of the group of elements consisting of Y and Gd, including any combination thereof” <p><u>Revised</u>: No need for construction at this time</p>
Everlight’s Proposed Construction
<p>“a general formula $(\text{Re}_{1-r}\text{SM}_r)_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$, where r is greater than or equal to zero and less than one, where s is greater than or equal to zero and less than or equal to one, and Re is Yttrium, Gadolinium, or any combination thereof”</p>

The formula terms set forth in Claims 3 and 6 recite the elements of the garnet fluorescent material and their relative proportions and the constant presence of $\text{O}_{12}:\text{Ce}$ in the composition. The

first group is represented by parenthetical $(\text{Re}_{1-r}\text{Sm}_r)_3$ where “Sm” is the element of Samarium and “Re” represents the elements Yttrium or Gadolinium. The second group is represented by the parenthetical term $(\text{Al}_{1-s}\text{Ga}_s)_5$ where “Ga” is the element Gallium and “Al” is the element Aluminum. Further, the term $(\text{Al}_{1-s}\text{Ga}_s)_5$ indicates that there are “s” moles of the element Gallium and “1-s” moles of the element Aluminum. The greater the Gallium content, the lesser the content of Aluminum and vice versa. Similarly, $(\text{Re}_{1-r}\text{Sm}_r)_3$ means that there are “r” moles of Samarium and “1-r” moles of Re, which is either Yttrium or Gadolinium. Therefore, the greater the content of Samarium, the lesser the content of either Yttrium or Gadolinium, and vice versa.

The Court finds that Everlight’s proposed construction helps to explain to the jury the relationship between the elements. Nichia’s original proposed construction contradicts the plain language by incorrectly stating that cerium be present. Cerium is not merely present—rather the chemical formula requires activation with cerium. Further, “each of Sm, Al, and Ga may be present but is not required to be present” distorts the claim language. If Gallium is completely absent, then only Aluminum will be left. There is no circumstance where neither Gallium nor Aluminum is present in the formula, thus Nichia’s construction allowing for such a circumstance is contrary to the plain language.

Further, Nichia’s argument that this term requires no construction appears disingenuous. Given that Nichia originally proposed a lengthy construction of this term, Nichia’s recent amendment to its position regarding construction of this term belies Nichia’s present assertion that the term requires no construction. The jury will be aided by explaining the meaning of the chemical formula and Everlight’s proposed construction comports with the recited formula in Claims 3 and 6.

5. “wherein the phosphor may contain a first fluorescent material represented by a general formula $\text{Y}_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$ and a second fluorescent material represented by

a general formula $\text{Re}_3\text{Al}_5\text{O}_{12}:\text{Ce}$, where $0 \leq s \leq 1$ and Re is at least one element selected from the group consisting of Y, Ga and La”

Nichia’s Proposed Constructions
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<p>“wherein the phosphor may contain two different fluorescent materials, the first being represented by a chemical formula having the elements Y, Al, Ga, O, and Ce, where:</p> <ol style="list-style-type: none"> 1) Y, O and Ce are present; 2) each of Al and Ga may be present, but is not required to be present; and 3) s is a variable that defines the amount of Ga relative to Al, such that where $s=0.5$, for example, the relative amounts of Ga and Al are equal; <p>the second being represented by a chemical formula $\text{Re}_3\text{Al}_5\text{O}_{12}:\text{Ce}$, and where Re represents one or more elements of the group of elements consisting of Y, Gd and La, including any combination thereof”</p>
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Revised: No need for construction at this time
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Everlight’s Proposed Construction
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<p>“wherein the phosphor may contain two different fluorescent materials, the first being represented by a general formula $\text{Y}_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$, where s is greater than or equal to zero and less than or equal to one, and the second being represented by a general formula $\text{Re}_3\text{Al}_5\text{O}_{12}:\text{Ce}$, where Re is Yttrium, Gadolinium, Lanthanum, or any combination thereof”</p>
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Claim 7 requires the garnet florescent material disclosed in Claim 1 consist of two different fluorescent materials, with the first florescent material “represented by a general formula $\text{Y}_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$ ” and the second fluorescent material “represented by general formula $\text{Re}_3\text{Al}_5\text{O}_{12}:\text{Ce}$ ” where the first material includes the constant presence of Yttrium and $\text{O}_{12}:\text{Ce}$, as well as Aluminum and Gallium in amounts relative to each other and summing to one. Similarly, the second fluorescent material includes the constant presence of Aluminum and $\text{O}_{12}:\text{Ce}$, as well as Re_3 where Re is at least one element from the group Yttrium, Gadolinium and Lanthanum. Thus, the material can have Yttrium, Gadolinium, Lanthanum that maintains the specified ratio by summing to three.

As with the previous term, Nichia withdrew its previous, inaccurate, and lengthy construction and now takes the position that no construction is necessary. For the reasons identified in the Court’s discussion of the previous term, the Court finds that Everlight’s proposed construction comports with

the plain language and will aid the jury in resolving the parties' claims.

6. "comprises a nitride compound semiconductor represented by the formula: $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$ where $0 \leq i, 0 \leq j, 0 \leq k$ and $i+j+k = 1$ "

Nichia's Proposed Constructions
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<p>"comprises a nitride compound semiconductor represented by a chemical formula having the elements In, Ga, Al, and N, where:</p>
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| <p>1) each of In, G, and Al may be present but is not required to be present; and
 2) i, j, and k are variables that defines the amount of In, Ga, and Al, respectively, relative to each other, such that where $i=0.2, j=0.2$, and $k=0.6$, for example, the relative amount of In is the same as the relative amount of Ga, and the relative amount of Al is three times the relative amounts of each of In and Ga"</p> |
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<p><u>Revised</u>: "comprises a semiconductor, which is represented by the stoichiometric formula $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$ where $(i+j+k)$ is about 1"</p>

<p><u>2nd Revision</u>: No construction needed at this time.</p>
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<p><u>3rd Revision</u>: comprises a nitride compound semiconductor represented by the formula $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$, where i is greater than or equal to zero, j is greater than or equal to zero, and k is greater than or equal to zero and where i plus j plus k equals one."</p>

Everlight's Proposed Construction
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<p>"comprises a nitride semiconductor which includes Nitrogen in a 1:1 stoichiometric relationship with one selected from the group consisting of Indium, Gallium, Aluminum, Indium-Gallium, Indium-Aluminum, Gallium-Aluminum, and Indium-Gallium-Aluminum"</p>
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Claim 1 discloses that the nitride compound is "represented by the formula $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$ where $0 \leq i, 0 \leq j, 0 \leq k$ and $i+j+k = 1$." Here, Everlight's proposed construction is more confusing for the jury because Everlight injects improper technical language, "a 1:1 stoichiometric relationship" and injects legalistic, close-ended *Markush* group language, "one selected from the group consisting of" into the construction as a purported substitution for the chemical formula. The Summary of the '925 Patent states that the nitride semiconductor is "generally represented" by the indicated formula. This is because the semiconductor materials contain dopants or impurities as described in examples 1,9 and 11 of the '925 Patent. The presence of such dopants necessarily impacts the 1:1 stoichiometric relationship of the elements. Thus, the Court adopts Nichia's third proposed construction for this

term: “[C]omprises a nitride compound semiconductor represented by the formula $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$, where i is greater than or equal to zero, j is greater than or equal to zero, and k is greater than or equal to zero and where i plus j plus k equals one.” Nichia’s recent proposed construction tracks Everlight’s constructions adopted by this Court for the other formula-based terms by reciting in words the mathematical relationship among the variables.

C. ‘960 Patent’s Disputed Terms

1. “the two or more kinds of fluorescent materials are independently arranged”

Nichia’s Proposed Constructions
“florescent material that absorbs light from the emitting component of a shorter wavelength is near the light emitting component, and a fluorescent material that absorbs light of a longer wavelength is away from the light emitting component”
Everlight’s Proposed Construction
“positioned in separate layers, without mixing”

Claim 5 of the ‘960 Patent discloses a light emitting device consisting of a light emitting component having a GaN semiconductor wherein “two or more kinds of fluorescent materials are independently arranged” *See* ‘960 Patent at 31:29-45. Everlight’s construction is supported by the ‘960 Patent’s specification which states: “In the second embodiment, the two or more kinds of yttrium-aluminum-garnet fluorescent materials activated with cerium of different compositions may be either used by mixing or arranged independently (laminated, for example).” ‘960 Patent at 19:6-10. The specification explains that “[w]hen the two or more kinds of fluorescent materials are arranged independently, color can be adjusted after forming it by laminating the layers” *Id.* at 19:13-16. Thus, Everlight’s construction is consistent with the specification’s description of what it means to “independently arrange” two or more fluorescent materials. The specification contrasts fluorescent materials that are “independently arranged” with fluorescent materials that are “mixed.”

Nichia’s construction improperly omits the requirement that the fluorescent materials be “independently arranged.” Thus, the Court adopts Everlight’s proposed construction of this term.

D. ‘215 Patent’s Disputed Terms

1. “Al,” “Ti,” “Pt,” “Au”

Everlight’s Proposed Construction
Al-“Aluminum”; Ti-“Titanium”; Pt- “Platinum”; Au - “Gold”
Nichia’s Proposed Construction
“aluminum that is as close to pure aluminum as practicable at the time of the invention (i.e. at least 99.99% pure aluminum)”
“titanium that is as close to pure titanium as practicable at the time of the invention (i.e. at least 99.99% pure titanium)”
“platinum that is as close to pure platinum as practicable at the time of the invention (i.e. at least 99.99% pure platinum)”
“gold that is as close to pure gold as practicable at the time of the invention (i.e. at least 99.99% pure gold)”

Claim 1 discloses the method for creating the contact on an n-type III-V semiconductor, which comprises “the steps of depositing Al . . . then depositing Ti. . . then depositing Pt. . . then depositing Au . . .” ‘215 Patent at 6:4-19. Everlight argues that the chemical symbols “Al,” “Ti,” “Pt,” and “Au” are well known abbreviations for the metals aluminum, titanium, platinum and gold. Everlight further asserts that Nichia improperly reads into the terms a limitation that each metal be “as close to pure as practicable at the time of the invention (i.e. at least 99.99% pure [metal].)”

The disclosure begins with the term “preferably,” which indicates an embodiment, and does not impose a requirement. *See* ‘215 Patent at 2:49-52 (“Most preferably, the base layer consists essentially of Al, the first barrier layer consists essentially of Ti, the second barrier layer consists

essentially of Pt and the top layer consists essentially of Au.”); *see also Cordis Corp. v. Medtronic Ave.*, 339 F.3d 1352, 1357 (Fed. Cir. 2003) (“[U]se of the term ‘preferably’ makes clear that the language describes a preferred embodiment, not the invention as a whole.”). Also, the specification describes several other embodiments with varying levels of impurities in the metals. ‘215 Patent at 3:61-62 (“The base layer desirably consists essentially of aluminum, with or without some titanium.”); *Id.* at 4:11 (“Each of these layers may include minor amounts of impurities which do not materially affect the performance of the finished contact as discussed below.”) Thus, there is no intrinsic support for Nichia’s 99.99% purity restriction.

Nichia is also incorrect in arguing that the ‘215 Patent provides for only two options for the purity of the metals. In addition to the embodiment that each metal be “at least about 75% of such metal” (‘215 Patent at 4:10) and “as close to a pure single metal layer as practicable,” (*Id.* at 4:17-20) the ‘215 Patent also describes an embodiment where “each of these layers may include minor amounts of impurities which do not materially affect the performance of the finished contact” (*Id.* at 4:11-13), an embodiment where the base layer “desirably consists essentially of aluminum, with or without some titanium” (*Id.* at 3:61-62), and an embodiment where the base layer “may include substantial amounts of Ti, as, for example, up to 25%.” (*Id.* at 4:14-16).

Contrary to Nichia’s argument, the 99.99% purity limitation is simply improper because the applicants did not give up a broad purity during the prosecution history in order to obtain the ‘215 Patent. “The doctrine of prosecution disclaimer is well established in Supreme Court precedent, precluding patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.” *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (citing *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 220-21 (1940)). Nichia relies on the cancellation of original Claim 18, which according to Nichia, was significantly broader than

the original Claim 1, and because Claim 18 included the “formed predominantly of” language and was cancelled, the subject matter covered by that language was disavowed by the applicants. As an initial matter, Nichia incorrectly characterizes Claim 18 as significantly broader than original Claim 1 because original Claim 18 included a purity limitation requiring “depositing [a particular layer] formed predominantly from/of” one or more metals. *See* Dkt. No. 101, Ex. 16. Therefore, there could not have been disavowal with respect to the purity of the metal layers as a result of the cancellation of the narrower, original Claim 18.

Additionally, the applicants provided no statements explaining why Claim 18 was cancelled, leaving its reasons unclear. The Federal Circuit makes clear that the doctrine of prosecution disclaimer should not be applied where the purported disavowal of a claim’s scope is ambiguous. *Omega Eng’g*, 334 F.3d at 1324 (citing *Northern Telecom Ltd. v. Samsung Electronics Company*, 215 F.3d 1281, 1293-95 (Fed. Cir. 2000) (“Since the prosecution statements were ‘far too slender a reed to support the judicial narrowing of a clear claim term,’ we declined to apply the doctrine of prosecution disclaimer under those circumstances.”). Further, nothing in the examiner’s Notice of Allowance supports Nichia’s disavowal argument, which merely recited the language of Claim 1. Thus, it would be inappropriate for this Court to rely on the patent examiner’s silence to construe this claim. *See DeMarini Sports v. Worth*, 239 F.3d 1314, 1326-27 (Fed. Cir. 2001) (“Drawing inferences of the meaning of claim terms from an examiner’s silence is not a proper basis on which to construe a patent claim, and we reject DeMarini’s arguments predicated on such inferences.”).

Thus, there is simply no purity limitation disclosed in the claims and a person of ordinary skill in the art would understand the terms “Al,” “Ti,” “Pt,” and “Au,” in the context of the specification and the claims, are used consistently with their plain and ordinary meaning.

2. “annealing said n-type III-V semiconductor with said stack thereon”

Everlight's Proposed Construction
"heating the n-type III-V semiconductor, with the stack placed upon it, sufficiently to form a contact with low resistance"
Nichia's Proposed Construction
"heating to a temperature between 400-900°C and for a duration sufficient to cause a desired change in a material property of the contact stack that remains after cooling, thereby creating an ohmic contact"

Everlight argues that its proposed construction concerning the annealing step in Claim 1 is based on the disclosures regarding the invention in the intrinsic record. *See, e.g.*, 1:34-46;1:64-2:20;2:39-40;2:63-64;3:50-2;4:25-32;4:43-56; claims 1 and 15; *see also* Dkt. No. 98, Ex. L, Provisional Application. In particular, the specification requires that the annealing step bring about a specific beneficial change—the forming of a low resistance ohmic contact. *Id.*, 2:15-20;2:39-40; 2:63-64("Whatever the mechanism of operation, the resulting contact has a low resistance and ohmic behavior.").

Everlight argues that Nichia's proposed construction of this term contains several errors and the Court agrees. First, Nichia improperly omits the requirement of the claims that the annealing be done on the "n-type III-V semiconductor." It is improper for Nichia to read out a limitation from a claim. *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 951 (Fed. Cir. 2006) ("adopting [a] proposed claim construction [which in effect] read limitations . . . out of the claim [would] be contrary to the principle that claim language should not be treated as meaningless."); *Tex. Instruments Inc. v. U.S. Trade Comm'n*, 988 F.2d 1165, 1172 (Fed. Cir. 1993) ("[T]he construction TI proposes must fail because it would read a limitation out of the claim."). Nichia also improperly reads in limitations—a specific heating temperature, and an ambiguous "desired change" that must be reached during heating and remain upon cooling.

Nichia argues that both intrinsic and extrinsic evidence compel its proposed construction. “Annealing” in the ‘215 Patent requires heating to a critical temperature. *Id.*, 4:25-27; 4:43-47. Nichia’s proposed construction is supported by the understanding in the art. *See 1999 Illustrated Dictionary of Metalworking and Manufacturing Technology* at 179, Dkt. No. 101, Ex. 21 (“[A]nnealing: The heating of a metal to just above the critical temperature for a given time and then cooling at a suitable rate to produce the desired qualities in the metal.”); *see also Agere Sys., Inc. v. Sony*, No. 2:06-cv-079, 2008 U.S. Dist. LEXIS 39605, *60 (E.D. Tex. May 15, 2008) (defining annealing in the context of another semiconductor patent to mean “heating to a temperature and for a duration sufficient to cause a desired change in the microstructure or in the physical and/or mechanical properties.”).

Contrary to Nichia’s argument, there is no intrinsic nor compelling extrinsic evidence supporting its argument that the scope of Claim 1 includes a specific temperature range. Neither the dictionary definition nor the decision in *Agere Sys., Inc., supra*, provide that annealing must occur at a specific temperature range. Further, the specification passages cited by Nichia describe only embodiments, evidenced by the use of the term “typical” in these passages. *See* ‘215 Patent at 2:47-49; (“The annealing step typically is performed at a temperature of about 400-600°C, for about 1-10 minutes.”); *Id.* at 4:33-47 (“One typical stack or in-process contact includes about 190-210 Å to 5 μm of gold The annealing of this stack can be performed either in nitrogen, argon or other inert gas, or air. Moderate temperatures of 400-600°C are sufficient for low contact resistances of the order of 10-5 ohm-cm² or lower.”); *see also Motorola, Inc. v. Nonin Med., Inc.*, 632 F.Supp. 2d 804, 810 (N.D. Ill. 2008) (“discussion of embodiments [referred to as] ‘typical exemplified embodiments,’ demonstrat[ed] that they are intended to be exemplary rather than exclusive embodiments This is not language that suggests an intent to confine the claims to the specific embodiments taught.”).

Thus, the specification does reference certain heating temperatures but those disclosures concern specific embodiments and are not drafted to be limiting. Moreover, the Court notes that the Patent Office has already rejected Nichia's proposal to insert the same heating temperature requirement in the scope of the claims of the '215 Patent. *See* Dkt. No. 98, Ex. M at 7 ("We do not agree with Nichia's construction because it would improperly import temperatures between 400-900°C from the specification into the claims as a limitation.").

The temperature range proposed in Nichia's construction is taken from the provisional application, wherein it was provided as an example of annealing temperatures used in the prior art for two-layer stacks. *See* Dkt. No. 98, Ex. L ("For this reason, most metallization schemes to N-GaN use Ti, Ti/Al or Al followed by Ni/Au. Annealing of the metallization is carried out at temperatures between 400-900 C for minimum contact resistance.") Thus, it is inappropriate to incorporate temperature limitations into the scope of the claim, which is directed to a four-layer stack using different metals than those disclosed in the prior, two-layer stack art.

Lastly, Nichia's proposed construction including language of a "desired change" that "remains after cooling" is nowhere in the intrinsic record. Nichia argues that the desired change of the annealing step is to create an ohmic contact, however the specification makes clear that the annealing step produces the beneficial change of forming a low resistance ohmic contact. *See* '215 Patent at 2:15-20 (describing the purpose of the invention as "provid[ing] a contact and a contact forming method for n-type GaN and other n-type III-V semiconductors which would provide a low-resistance ohmic contact . . ."); *Id.* at 2:39-40 ("Then-type III-V semiconductor with the stack is annealed to form the contact."); *Id.* at 2:63-64 ("Whatever the mechanism of operation, the resulting contact has a low resistance and ohmic behavior."). Further, the provisional application echoes the requirement that the annealing step create a low resistance contact. *See* Dkt. No. 98, Ex. L at 1

(“Annealing of the metal stack, to bring the contact metal in intimate contact with the semiconductor, is necessary to achieve the maximum possible reduction in contact resistance.”).

Based on the foregoing reasons, the Court adopts Everlight’s proposed construction of this term.

3. “barrier layer”

Everlight’s Proposed Construction
“a layer provided to prevent undesirable results (e.g., diffusion) between the top layer and the base layer”
Nichia’s Proposed Constructions
<p>“a layer provided to prevent undesirable reactions (e.g., diffusion) between the top layer and the base layer, and positioned in physical contact with and supported by the [previous layer]”</p> <p>Under the proposed constructions, the following phrases would have the stated constructions:</p> <ul style="list-style-type: none"> • “first barrier layer” would be construed as “a layer provided to prevent undesirable (e.g., diffusion) between the top layer and the base layer, and positioned in physical contact with and supported by the base layer” • “second barrier layer” would be construed as “a layer provided to prevent undesirable reactions (e.g., diffusion) between the top layer and the base layer, and positioned in physical contact with and supported by the first barrier layer” <p><u>Revised:</u> “first barrier layer:” “first metal layer provided to prevent undesirable reactions (e.g., diffusion) between the top layer and the base layer, and being in direct contact with the base layer. “second barrier layer:” “second metal layer provided to prevent undesirable reactions (e.g., diffusion) between the top layer and the base layer, and being in direct contact with the first barrier layer”</p>

Here, the parties agree that the “barrier layer” disclosed in Claims 1, 6-7 and 9 is a “layer provided to prevent undesirable reactions (e.g., diffusion) between the top layer and the base layer.” The gist of the parties’ dispute concerning this claim is whether the construction should be qualified by the language “being in direct contact with.” Nichia argues that its constructions are compelled by the plain language of Claim 1, which recites “depositing Ti on said base layer to provide a first barrier layer . . .” and “depositing Pt on said first barrier layer to provide a second barrier layer” Further, the specification explicitly states:

In this in-process state, the contact of this embodiment includes a base layer 34 abutting the n-type semiconductor 10, a first barrier layer 36 overlying the base layer, a second barrier layer 38 overlying the first barrier layer and forming the top or exposed surface of the contact, remote from the n-type semiconductor.

Id., 3:53-60. However, here again Nichia ignores that this disclosure merely describes an embodiment, thus limiting the scope of this claim on this basis would be inappropriate. *See Phillips*, 415 F.3d at 1323 (“[W]e have repeatedly warned against confining the claims to [specific] embodiments.”).

Further, Nichia’s proposed constructions are improper because they impermissibly exclude a specific embodiment disclosed in the ‘215 Patent. Specifically, Nichia’s proposed constructions are qualified by “being in direct contact with the [first or second] barrier.” The ‘215 Patent contemplates the aluminum base layer to include up to 25% of titanium. The patent also states that “[i]n this case, the step of depositing Al can include the step of depositing some Ti along with the Al.” *Id.* at 4:15-17. Thus, in this embodiment there may not be a distinct dividing line, no direct “contact” between the base layer and the barrier layer because the titanium top of the base layer may be merged with the titanium-containing barrier layer.

Further, the construction would create ambiguity in the scope of the claims of the ‘215 Patent. The claims and specification contemplate the barrier layers in two states-before annealing and upon annealing. Nichia’s proposed construction completely ignores the possibility of interaction and transformation of metals upon annealing. The patent is clear that upon annealing, the aluminum base layer may be alloyed or diffused with the titanium layer. *Id.* at 2:64-65 (“There may be some alloying of Ti and Al”); *Id.* at 4:47-49 (“Where the first barrier layer includes Ti, there can be some diffusion of Ti and the Al-containing base layer during annealing.”). The term “direct contact” does not cover such interaction and intermingling between the barrier layer and the base layer. Thus, Nichia’s use

of “direct contact” in its proposed construction finds no support in the intrinsic record, and the Court adopts Everlight’s proposed construction of this term.

4. “base layer”

Everlight’s Proposed Construction
“the first-deposited metal layer used to form a low-resistance, ohmic contact to the semiconductor”
Nichia’s Proposed Construction
“the first-deposited metal layer used to form a low-resistance, ohmic contact to the semiconductor, and positioned in physical contact with and supported by a top surface of the n-type III-V semiconductor”
<u>Revised:</u> “the first- deposited metal layer used to form a low resistance, ohmic contact to the semiconductor, and being in direct contact with a top surface of the n-type III-V semiconductor”

Consistent with this Court’s construction of “barrier layer,” the Court similarly finds that Nichia’s proposed construction containing the phrase “direct contact” should be excluded from this term because it creates ambiguity in the scope of Claim 1. The ‘215 Patent teaches that in order to achieve a low resistance contact, the “Al in the base layer abutting the n-type semiconductor diffuses into the semiconductor and/or forms intermediate materials at the boundary with the n-type semiconductor. *Id.*, 2:58-4. This disclosure cannot be reconciled with Nichia’s proposed construction requiring that the base layer be in “direct contact” with the “top surface” of the semiconductor. Upon annealing, the base layer may diffuse into the top surface of the semiconductor, or even form a different material-an alloy or compound-with the top surface of the semiconductor. *See* Dkt. No. 98, Ex. E, Dec. of Prof. Mark S. Goorsky. Nichia ignores the state of the base layer upon annealing—the state in which the base layer does its job. Thus, the Court rejects Nichia’s proposed construction of “base layer” and adopts Everlight’s proposed construction of this term.

5. “depositing Al on the n-type III-V semiconductor to provide a base layer”; (ii) “depositing Ti on said base layer to provide a first barrier layer”; (iii) “depositing Pt on said first barrier layer to provide a second barrier layer”; and (iv) “depositing Au on said second barrier layer to provide a top layer”

Everlight’s Proposed Construction
No construction necessary
Nichia’s Proposed Construction
<p>“depositing [an element] positioned in physical contact with and supported by [the given layer] to form [a next layer] that consists essentially of [the element] and is as close to a pure [element] layer as practicable at the time of the invention, i.e. at least 99.99% pure [element]”</p> <p>Under the proposed constructions:</p> <ul style="list-style-type: none"> • “depositing Al on the n-type III-V semiconductor to provide a base layer” would be construed as “depositing aluminum positioned physical contact with and supported by a top surface of the n-type III-V semiconductor to form a base layer that consists essentially of aluminum and is as close to a pure aluminum layer as practicable at the time of the invention, i.e. at least 99.99% pure aluminum” <p><i>See</i> Dkt. No. 110, Ex. V at 7-8 for the remaining portion of Nichia’s proposed construction of this term</p>

Here, there are three disputes between the parties concerning the construction of these terms. One of the disputes concerns the construction of chemical symbols “Al,” “Ti,” “Pt,” and “Au,” which this Court has already rejected Nichia’s proposed construction of these terms requiring that the metals be 99.99% pure. Further, the dispute concerning the term “on” is similar to the dispute concerning the “direct contact” clause in Nichia’s proposed constructions for “base layer” and “barrier layer.” This Court has already determined that there is nothing in the intrinsic record to support limiting the scope of the ‘215 Patent claims to “physical contact” between the layers.

Further, Nichia proposes to insert an additional process step in the scope of the claims. Nichia’s construction requires that a layer be both “deposited” and “positioned.” The patent describes several techniques of deposition, some of which cannot accommodate “positioning.” *See* ‘215 Patent at 4:20-

24. For instance, the methods of “sputtering” and “evaporation” do not deal with plates of metals that can be placed one on top of the other but rather involve deposition of particles of metals onto a substrate. *See* Dkt. No. 98, Ex. E, Dec. of Professor Mark S. Goorsky at ¶73.

Nichia also argues that the term “provide” in the “depositing on . . .” phrases should be construed as “form.” However, the intrinsic evidence does not suggest that these terms are used interchangeably. *See* ‘215 Patent at 6:4-18 (“forming a contact,” “form a stack”). Each word in a patent must have a meaning, and two different terms used in a patent claim cannot mean the same thing. *See Exxon Chem. Patents v. Lubrizol Corp.*, 64 F.3d 1553, 1557 (Fed. Cir. 1995) (A court “must give meaning to all words in [the] claims.”); *TiVo Inc. v. EchoStar Communs. Corp.*, No. 2:04-cv-1-DF, 2005 U.S. Dist. LEXIS 46879, *32-33 (E.D. Tex. Aug. 18, 2005) (“Thus, in order to construe ‘extract’ consistently in each of the four claims, ‘extract’ cannot mean ‘obtain’ or the construction would violate the presumption that each term has its own meaning and that the use of different terms reflects differentiation in meaning.”). Contrary to Nichia’s arguments, neither “form” nor “provide” require construction, one of ordinary skill in the art would understand that “provide” in Claim 1 refers to supplying components or materials, and “form” refers to making or constructing, which is consistent with the dictionary definitions for these terms. *See* Dkt. No. 98, Ex. E, Dec. of Professor Mark S. Goorsky at ¶78; see also Ex. P. Thus, the Court rejects Nichia’s proposed constructions of these terms and finds that no construction is necessary.

6. “then”

Everlight’s Proposed Construction
No construction necessary
Nichia’s Proposed Construction

“a [given step] is the next step in the forming process, following the completion of [the previous step]” Under the proposed constructions, the following phrases would have the stated constructions:

- “then (b) depositing Ti . . .” would be construed as “step (b) is the next step forming process, following the completion of step (a)”
- “then (c) depositing Pt . . .” would be construed as “step (c) is the next step in the forming process, following the completion of step (b)”
- “then (d) depositing Au . . .” would be construed as “step (d) is the next step forming process, following the completion of step (c)”
- “and then (e) annealing . . .” would be construed as “step (e) is the next step in the forming process, following the completion of step (d)”

Revised: “[a given step] is the next step in the manufacturing process, following the completion of [the previous step]” Under the proposed constructions, the following phrases would have the stated constructions:

- “then (b) depositing Ti . . .” would be construed as “then, as the next step in the forming process, following the completion of step (a), depositing Ti”

See Dkt. No. 110, Ex. V at 9 for the remaining portion of Nichia’s revised, proposed construction of this term.

Everlight argues that no construction is necessary. The plain English word “then” does not require construction. A person of ordinary skill in the art would have no trouble understanding the meaning of this term in the context of the ‘215 Patent. There is no question that the fact finder would not need help understanding this word. See *ACQIS LLC v. Appro Int’l, Inc.*, No. 6:09-cv-148, 2010 U.S. Dist. LEXIS 77548, *28-29 (E.D. Tex. Aug. 2, 2010) (declining to construe claim terms when no ambiguity exists because “the claim language is clear and understandable to the fact finder and any substitute for the claim language is likely to cause confusion rather than aid.”); *Orion IP, LLC v. Staples, Inc.*, 406 F.Supp. 2d 717, 738 (E.D. Tex. 2005) (“although every word used in a claim has a meaning, not every word requires a construction.”).

Here, Nichia’s proposed construction ignores the intrinsic record. See *Phillips*, 415 F.3d at 1315 (finding that the specification is “the single best guide to the meaning of a disputed term . . .”); *Chimie*, 402 F.3d at 1377 (“[c]laim construction begins with the intrinsic evidence of record.”). The

specification of the ‘215 Patent describes at least one embodiment including an additional step performed during the depositing of the four metal layers. *See* ‘215 Patent 4:15-17 (“In this case, the step of depositing Al can include the step of depositing some Ti along with the Al.”) Additionally, the ‘215 Patent discloses that any conventional deposition technique can be used for performing the deposition steps. *Id.* at 4:20-25. Thus, it is inaccurate to construe these terms as requiring no intervening manufacturing steps, such as cleaning between steps (a) and (e) in Claim 1. *See* Dkt. No. 98, Ex. E, Dec. of Professor Mark S. Goorsky at ¶81; *see also MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007) (“A claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”).

Thus, it is clear from the intrinsic record that the only meaning of the term “then” is the order in which the depositing and annealing steps must be performed. *See* ‘215 Patent at Abstract (“formed by depositing Al, Ti, Pt and Au in that order on the n-type semiconductor and annealing the resulting stack . . .”). Further, Nichia’s proposed construction of the term “then” includes the term “then”—“then (b) depositing Ti . . .” would be construed as ‘then, as the next step in the forming process, following the completion of step (a), depositing Ti.’” This shows that the term “then” requires no construction and must be given its plain and ordinary meaning. The Court therefore rejects Nichia’s proposed constructions of these terms.

7. “about”

Everlight’s Proposed Construction
No construction necessary
Nichia’s Proposed Constructions

“plus or minus the measurement error [and, for contact resistance, the calculation error] (i.e., [specific numeric range])” Under the proposed constructions, the following phrases would have the stated constructions:

- “about 400-600°C: “400°C plus or minus the measurement error, to 600°C plus or minus the measurement error (i.e., 395°C to 605°C)”

See Dkt. No. 110, Ex. V at 10-11 for the remaining portion of Nichia’s proposed construction of this term.

Revised:

“plus or minus the measurement error [and, for contact resistance, the calculation error] (i.e., specific numeric range)” Under the proposed constructions, the following phrases would have the stated constructions:

- “about 400-600°C” would be construed as “400°C plus or minus the measurement error, to 600°C plus or minus the measurement error (i.e., 395°C to 605°C)”

See *id.* at 11-13 for the remaining portion of Nichia’s revised, proposed construction of this term.

Everlight argues that the term “about” should be construed to the full breadth of its plain and ordinary meaning. There are roughly 30 instances of the term “about” in the ‘215 Patent specification and claims. The inventors had no intention to define the word “about.” If that was their intention, they would have included an entire page of explanations for each instance of measured units, just like Nichia attempts to do in its page-long proposed construction for the one-word term “about.” The term “about” is routinely used in patent claims, and the courts routinely construe it as plain meaning. See *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1369 (Fed. Cir. 2005); *Takeda Pharm. Co., Ltd. v. Handa Pharms., LLC, Inc.*, No. C-11-00840, 2012 U.S. Dist. LEXIS 51013, *72-74 (N.D. Cal. Apr. 11, 2012); *Unigene Labs, Inc. v. Apotex Inc.*, No. 06-cv-5571, 2008 U.S. Dist. LEXIS 66005, *26-27 (S.D.N.Y. Aug. 28, 2008). Further, the Federal Circuit has acknowledged that the term “about” in relation to numerical values generally means “approximately” or “not exact.” *Merck*, 395 F.3d at 1369 (“We reverse the district court’s construction of ‘about’ and hold that such term should be given its ordinary meaning of ‘approximately.’”). Thus, like these cases, the Court should not construe the term “about” beyond acknowledging that it should be given its ordinary and

plain meaning.

Nichia argues that the term “about” is used throughout the ‘215 Patent claims and specification, but the patent provides no guidance as to what that term means. The term “about,” has been the subject of a number of prior legal decisions. *See Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217 (Fed. Cir. 1995). Thus, in the context of the semiconductor arts, “about” should be construed as “plus or minus the measurement error [and, for contact resistance] the calculation error.” *See* Ex. 15, Schubert Declaration at ¶ 22 (“A person of ordinary skill would recognize that there is necessarily some measurement error and, in some cases, calculation error when one is measuring the various parameters recited in the claims. It is reasonable to assume that this is what the ‘215 Patent is attempting to account for when it uses the term ‘about.’”). Other courts have similarly construed temperature ranges using the term “about.” *See Motorola, Inc. v. Analog Devices, Inc.* No.1:03-cv-131, 2004 U.S. Dist. LEXIS 31298, *13 (E.D. Tex. Mar. 23, 2004) (“from about 650°C to about 1,000°C means: 650°C, plus or minus some reasonable measurement error, to 1,000°C, plus or minus some reasonable measurement error. The term ‘reasonable measurement error’ will depend upon the accuracy of temperature measuring devices available for use in a closed reactor system such as this, at the time the patent was issued.”)

Here, the Court rejects Nichia’s attempt to impose arbitrary measurement and calculation errors for the claim terms using “about.” The specification uses the term “about” with various measurement units, with single numbers, “about 3 minutes,” as well as ranges, “about 400-600°C,” and provides no indication that specific measurement and calculation errors were to be imposed upon the scope of the claims where this term is used. Nichia’s expert declaration supports the conclusion that a person of ordinary skill in the art would know the meaning of the term “about” in the context of the ‘215 Patent and that there is no need for construction of this term.

IV. CONCLUSION

For the reasons set forth above, the Court concludes with respect to the patents-in-suit:

The term “a garnet fluorescent material comprising 1) at least one element selected from the group consisting of Y, Lu, Sc, La, Gd and Sm, and 2) at least one element selected from the group consisting of Al, Ga and In, and being activated with cerium” means “a garnet fluorescent material comprising one or more elements selected from Yttrium, Lutetium, Scandium, Lanthanum, Gadolinium, and Samarium; and one or more elements selected from Aluminum, Gallium, and Indium, and being activated with cerium.”

The term “main emission peak” means “peak emission wavelength.”

The term “wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Y and Al” requires no construction.

The term “a general formula $(\text{Re}_{1-r}\text{SM}_r)_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$, where $0 \leq r < 1$ and $0 \leq s \leq 1$ and Re is at least one selected from Y and Gd” means “a general formula $(\text{Re}_{1-r}\text{SM}_r)_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$, where r is greater than or equal to zero and less than one, where s is greater than or equal to zero and less than or equal to one, and Re is Yttrium, Gadolinium, or any combination thereof.”

The term “wherein the phosphor may contain a first fluorescent material represented by a general formula $\text{Y}_3(\text{Al}_{1-s}\text{Ga}_s)_5\text{O}_{12}:\text{Ce}$ and a second fluorescent material represented by a general formula $\text{Re}_3\text{Al}_5\text{O}_{12}:\text{Ce}$, where $0 \leq s \leq 1$ and Re is at least one element selected from the group consisting of, Gd and La” means ““wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Yttrium and Aluminum that is different from the said garnet fluorescent material.”

The term “comprises a nitride compound semiconductor represented by the formula: $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$ where $0 \leq i, 0 \leq j, 0 \leq k$ and $i+j+k = 1$ ” means “comprises a nitride compound semiconductor represented by the formula $\text{In}_i\text{Ga}_j\text{Al}_k\text{N}$, where i is greater than or equal to zero, j is greater than or equal to zero, and

k is greater than or equal to zero and where i plus j plus k equals one.”

The term “the two or more kinds of florescent materials are independently arranged” means “positioned in separate layers, without mixing.”

The terms “Al,” “Ti,” “Pt,” and “Au” mean “Aluminum, Titanium, Platinum and Gold.”

The term “annealing said n-type III-V semiconductor with said stack thereon” means “heating the n-type III-V semiconductor, with the stack placed upon it, sufficiently to form a contact with low resistance.”

The term “barrier layer” means “a layer provided to prevent undesirable results (e.g., diffusion) between the top layer and the base layer.”

The term “base layer” means “the first-deposited metal layer used to form a low-resistance, ohmic contact to the semiconductor.”

The term “depositing Al on the n-type III-V semiconductor to provide a base layer”; (ii) “depositing Ti on said base layer to provide a first barrier layer”; (iii) “depositing Pt on said first barrier layer to provide a second barrier layer”; and (iv) “depositing Au on said second barrier layer to provide a top layer” requires no construction.

The term “then” requires no construction.

The term “about” requires no construction.

SO ORDERED.

Dated: August 21, 2013

/s/ Gershwin A. Drain
GERSHWIN A. DRAIN
UNITED STATES DISTRICT JUDGE